

## CLAIMS

What is claimed is:

1. An apparatus for providing gas and electric power to a plasma arc torch comprising:  
a selector comprising at least a first operating position and a second operating position,  
wherein the first operating position operates the apparatus in a first mode to deliver the gas to the plasma arc torch, and the second operating position operates the apparatus in a second mode to deliver the gas and the electric power to the plasma arc torch.
2. The apparatus according to Claim 1 further comprising a housing, wherein the selector is disposed within the housing.
3. The apparatus according to Claim 2, wherein the selector is slidably operable between the first operating position and the second operating position.
4. The apparatus according to Claim 1, wherein the selector further comprises a neutral position for selecting a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.
5. The apparatus according to Claim 4, wherein the selector is resiliently biased to the neutral position.
6. The apparatus according to Claim 5 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

7. The apparatus according to Claim 4, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

8. The apparatus according to Claim 4 further comprising a housing, wherein the selector is disposed within the housing.

9. The apparatus according to Claim 8, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

10. An apparatus for providing gas and electric power to a plasma arc torch comprising:

a selector comprising a first operating position, a second operating position, and a neutral position,

wherein the first operating position operates the apparatus in a first mode to deliver the gas to the plasma arc torch, the second operating position operates the apparatus in a second mode to deliver the gas and the electric power to the plasma arc torch, and the neutral position operates the apparatus in a neutral mode to inhibit delivery of the gas and the electric power to the plasma arc torch.

11. The apparatus according to Claim 10 further comprising a housing, wherein the selector is disposed within the housing.

12. The apparatus according to Claim 10, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

13. The apparatus according to Claim 10, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

14. The apparatus according to Claim 10, wherein the selector is resiliently biased to the neutral position.

15. The apparatus according to Claim 14 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

16. An apparatus for providing gas and electric power to a plasma arc torch comprising:

a selector comprising at least a first operating position,

wherein the first operating position operates the apparatus in a first mode to deliver the gas to the plasma arc torch.

17. The apparatus according to Claim 16, wherein the selector further comprises a second operating position that operates the apparatus in a second mode to deliver the gas and the electric power to the plasma arc torch.

18. The apparatus according to Claim 17 further comprising a housing, wherein the selector is disposed within the housing.

19. The apparatus according to Claim 18, wherein the selector is slidably operable between the first operating position and the second operating position.

20. The apparatus according to Claim 16, wherein the selector further comprises a neutral position for selecting a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

21. The apparatus according to Claim 20, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

22. The apparatus according to Claim 20 further comprising a housing, wherein the selector is disposed within the housing.

23. The apparatus according to Claim 20, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

24. The apparatus according to Claim 20, wherein the selector is resiliently biased to the neutral position.

25. The apparatus according to Claim 24 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

26. An apparatus for providing gas and electric power to a plasma arc torch comprising:

a selector comprising at least a second operating position and a neutral position,

wherein the second operating position operates the apparatus in a second mode to deliver the gas and the electric power to the plasma arc torch, and the neutral position operates the apparatus in a neutral mode to inhibit delivery of the gas and the electric power to the plasma arc torch.

27. The apparatus according to Claim 26, wherein the selector further comprises a first operating position that operates the apparatus in a first mode to deliver the gas to the plasma arc torch.

28. The apparatus according to Claim 27 further comprising a housing, wherein the selector is disposed within the housing.

29. The apparatus according to Claim 27, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

30. The apparatus according to Claim 26, wherein the selector is resiliently biased to the neutral position.

31. The apparatus according to Claim 30 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.



32. The apparatus according to Claim 26, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

33. A trigger system for providing gas and electric power to a plasma arc torch comprising:

a housing; and

a selector disposed within the housing for selecting among one of a first operating position, a second operating position, and a neutral position,

wherein positioning the selector in the first operating position delivers the gas to the plasma arc torch, positioning the selector in the second operating position delivers the gas and the electric power to the plasma arc torch, and positioning the selector in the neutral position inhibits delivery of the gas and the electric power to the plasma arc torch.

34. The trigger system according to Claim 33, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

35. The trigger system according to Claim 34, wherein the selector is resiliently biased to the neutral position.

36. The trigger system according to Claim 35 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

37. The trigger system according to Claim 33, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.



38. A trigger system for providing gas and electric power to a plasma arc torch comprising:

a housing; and

a selector disposed within the housing for selecting among one of a first operating position and a second operating position,

wherein positioning the selector in the first operating position delivers the gas to the plasma arc torch and positioning the selector in the second operating position delivers the gas and the electric power to the plasma arc torch.

39. The trigger system according to Claim 38, wherein the selector is slidably operable between the first operating position and the second operating position.

40. The trigger system according to Claim 38, wherein the selector further comprises a neutral position for selecting a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

41. The trigger system according to Claim 40, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

42. The trigger system according to Claim 40, wherein the selector is resiliently biased to the neutral position.

43. The trigger system according to Claim 42 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

44. A trigger system for providing gas and electric power to a plasma arc torch comprising:

a housing; and

a selector disposed within the housing for selecting at least a first operating position,

wherein positioning the selector in the first operating position delivers the gas to the plasma arc torch.

45. The trigger system according to Claim 44, wherein the selector further comprises second operating position that operates the plasma arc torch in a second mode to deliver the gas and the electric power to the plasma arc torch.

46. The trigger system according to Claim 45, wherein the selector is slidably operable between the first operating position and the second operating position.

47. The trigger system according to Claim 44, wherein the selector further comprises a neutral position for selecting a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

48. The trigger system according to Claim 47, wherein the selector is slidably operable between the first operating position and the neutral position.

49. The trigger system according to Claim 47, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

50. The trigger system according to Claim 47, wherein the selector is resiliently biased to the neutral position.

51. The trigger system according to Claim 50 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

52. A trigger system for providing gas and electric power to a plasma arc torch comprising:

a housing; and

a selector disposed within the housing for selecting among one of a second operating position and a neutral position,

wherein positioning the selector in the second operating position delivers the gas and the electric power to the plasma arc torch, and positioning the selector in the neutral position operates the plasma arc torch in a neutral mode to inhibit delivery of the gas and the electric power to the plasma arc torch.

53. The trigger system according to Claim 52, wherein the selector is slidably operable between the second operating position and the neutral position.

54. The trigger system according to Claim 52, wherein the selector further comprises a post that engages an adjacent member within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position

55. The trigger system according to Claim 52, wherein the selector is resiliently biased to the neutral position.

56. The trigger system according to Claim 54 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

57. The trigger system according to Claim 52, wherein the selector further comprises a first operating position that operates the plasma arc torch in a first mode to deliver the gas to the plasma arc torch.

58. The trigger system according to Claim 57, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

59. A plasma arc torch comprising:  
a torch handle;  
a gas control device disposed within the torch handle;  
a housing disposed within the torch handle and operable with the gas control device;  
a power switch disposed within the torch handle; and  
a selector disposed within the housing and operable with the power switch;

wherein the selector is operable to a first operating position such that the housing activates the gas control device, thereby operating the plasma arc torch in a first mode to deliver gas to the plasma arc torch; and

wherein the selector is operable to a second operating position such that the selector activates the power switch, thereby operating the plasma arc torch in a second mode to deliver gas and electric power to the plasma arc torch.

60. The plasma arc torch according to Claim 59, wherein the selector is slidably operable between the first operating position and the second operating position.

61. The plasma arc torch according to Claim 59, wherein the housing is pivotably mounted to the torch handle.

62. The plasma arc torch according to Claim 59, wherein the selector further comprises a neutral position for selecting a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

63. The plasma arc torch according to Claim 62, wherein the torch handle further defines a stop and the selector further comprises a post that engages the stop in the neutral position such that delivery of gas and electric power to the plasma arc torch is inhibited.

64. The plasma arc torch according to Claim 62, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

65. The plasma arc torch according to Claim 62, wherein the selector is resiliently biased to the neutral position.

66. The plasma arc torch according to Claim 65 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

67. A plasma arc torch comprising:  
a torch handle;  
a gas control device disposed within the torch handle;  
a housing disposed within the torch handle and operable with the gas control device;  
a power switch disposed within the torch handle; and  
a selector disposed within the housing and operable with the power switch;

wherein the selector is operable to a first operating position such that the housing activates the gas control device, thereby operating the plasma arc torch in a first mode to deliver gas to the plasma arc torch,

wherein the selector is operable to a second operating position such that the selector activates the power switch, thereby operating the plasma arc torch in a second mode to deliver gas and electric power to the plasma arc torch; and

wherein the selector is operable to a neutral position such that delivery of gas and electric power to the plasma arc torch is inhibited.

68. The plasma arc torch according to Claim 67, wherein the torch handle further defines a stop and the selector further comprises a post that engages the stop in the neutral position such that delivery of gas and electric power to the plasma arc torch is inhibited.

69. The plasma arc torch according to Claim 67, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.



70. The plasma arc torch according to Claim 67, wherein the housing is pivotably mounted to the torch handle.

71. The plasma arc torch according to Claim 67, wherein the selector is resiliently biased to the neutral position.

72. The trigger system according to Claim 71 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

73. A plasma arc torch comprising:  
a torch handle;  
a gas control device disposed within the torch handle;  
a housing disposed within the torch handle and operable with the gas control device; and

a selector disposed within the housing;  
wherein the selector is operable to a first operating position such that the housing activates the gas control device, thereby operating the plasma arc torch in a first mode to deliver gas to the plasma arc torch.

74. The plasma arc torch according to Claim 73, wherein the selector further comprises a neutral position for selecting a neutral mode in which delivery of the gas to the plasma arc torch is inhibited.

75. The plasma arc torch according to Claim 74, wherein the selector further comprises a post and the torch handle further comprises a stop,

wherein the post engages the stop to inhibit upward movement of the selector when the selector is in the neutral position.

76. The plasma arc torch according to Claim 74, wherein the selector is slidably operable between the first operating position and the neutral position.

77. The plasma arc torch according to Claim 74, wherein the selector is resiliently biased to the neutral position.

78. The plasma arc torch according to Claim 77 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

79. The plasma arc torch according to Claim 73 further comprising a power switch disposed within the torch handle, and the selector further comprising a second operating position such that the selector activates the power switch, thereby operating the plasma arc torch in a second mode to deliver gas and electric power to the plasma arc torch.

80. The plasma arc torch according to Claim 79, wherein the selector is slidably operable between the first operating position and the second operating position.

81. A plasma arc torch comprising:
- a torch handle;
  - a gas control device disposed within the torch handle;
  - a housing disposed within the torch handle and operable with the gas control device;
  - a power switch disposed within the torch handle; and
  - a selector disposed within the housing and operable with the power switch,
- wherein the selector is operable to a second operating position such that the selector activates the power switch, thereby operating the plasma arc torch in a second mode to deliver gas and electric power to the plasma arc torch; and
- wherein the selector is operable to a neutral position such that delivery of gas and electric power to the plasma arc torch is inhibited.
82. The plasma arc torch according to Claim 81, wherein the selector is slidably operable between the second operating position and the neutral position.
83. The plasma arc torch according to Claim 81, wherein the selector is resiliently biased to the neutral position.
84. The plasma arc torch according to Claim 83 further comprising a first spring and a second spring disposed within the housing, wherein the first spring and the second spring resiliently bias the selector to the neutral position.

85. The plasma arc torch according to Claim 81, wherein the torch handle further defines a stop and the selector further comprises a post that engages the stop in the neutral position such that delivery of gas and electric power to the plasma arc torch is inhibited.

86. The plasma arc torch according to Claim 81, wherein the selector further comprises a first operating position that operates the apparatus in a first mode to deliver the gas to the plasma arc torch.

87. The plasma arc torch according to Claim 86, wherein the selector is slidably operable between the first operating position, the second operating position, and the neutral position.

88. The plasma arc torch according to Claim 81, wherein the torch handle further comprises a second stop and the selector further comprises a post that engages the second stop such that the selector is inhibited from moving to a first operating position.

89. A housing disposed within a trigger system of a plasma arc apparatus that houses a selector, the selector being operable among one or more of a first operating position, a second operating position, and a neutral position,

wherein the first operating position operates the plasma arc apparatus in a first mode to deliver gas to a plasma arc torch, the second operating position operates the plasma arc apparatus in a second mode to deliver the gas and electric power to the plasma arc torch, and the neutral position that operates the plasma arc apparatus in a neutral mode such that delivery of gas and electric power to the plasma arc torch is inhibited.

90. The housing according to Claim 89, wherein the housing defines an aperture for disposition of the selector.

91. The housing according to Claim 89, wherein the housing is pivotably mounted within the plasma arc torch.

92. The housing according to Claim 89 further comprising an engagement cup that activates a gas control device to deliver gas to the plasma arc torch.

93. A selector for use in a trigger system of a plasma arc apparatus, the selector being operable among one or more of a first operating position, a second operating position, and a neutral position,

wherein the first operating position operates the plasma arc apparatus in a first mode to deliver gas to a plasma arc torch, the second operating position operates the plasma arc apparatus in a second mode to deliver the gas and electric power to the plasma arc torch, and the neutral position that operates the plasma arc apparatus in a neutral mode such that delivery of gas and electric power to the plasma arc torch is inhibited.

94. The selector according to Claim 93, wherein the selector further comprises a post that engages an adjacent component within the plasma arc torch to inhibit upward movement of the selector when the selector is in the neutral position.

95. The selector according to Claim 93 further comprising an engagement member that activates a power switch disposed within the plasma arc torch to provide at least the electric power.

96. A method of operating a plasma arc torch between one of at least a first operating mode and a second operating mode, the method comprising the steps of:

providing a trigger system comprising a selector; and

moving the selector between one of a first operating position and a second operating position,

wherein the first operating position operates the plasma arc torch in the first mode to deliver gas to the plasma arc torch, and the second operating position operates the plasma arc torch in the second mode to deliver the gas and electric power to the plasma arc torch.

97. The method according to Claim 96 further comprising the step of moving the selector to a neutral position such that delivery of the gas and the electric power to the plasma arc torch is inhibited.



98. A method of operating a plasma arc torch between a first operating mode, a second operating mode, and a neutral mode, the method comprising the steps of:

providing a trigger system comprising a selector; and

moving the selector between one of a first operating position, a second operating position, a neutral position,

wherein the first operating position operates the plasma arc torch in the first mode to deliver gas to the plasma arc torch, the second operating position operates the plasma arc torch in the second mode to deliver the gas and electric power to the plasma arc torch, and the neutral position selects a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

99. A method of operating a plasma arc torch in a first operating mode comprising the steps of:

providing a trigger system comprising a selector; and

moving the selector to a first operating position,

wherein the first operating position operates the plasma arc torch in the first mode to deliver gas to the plasma arc torch.

100. The method according to Claim 99 further comprising the step of moving the selector to a second operating position, wherein the second operating position operates the plasma arc torch in a second mode to deliver gas and electric power to the plasma arc torch.

101. The method according to Claim 99 further comprising the step of moving the selector to a neutral position, wherein the neutral position selects a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

102. A method of operating a plasma arc torch between one of at least a second operating mode and a neutral mode, the method comprising the steps of:

providing a trigger system comprising a selector; and

moving the selector between one of a second operating position and a neutral position,

wherein the second operating position operates the plasma arc torch in the second mode to deliver the gas and electric power to the plasma arc torch, and the neutral position selects a neutral mode in which delivery of the gas and the electric power to the plasma arc torch is inhibited.

103. The method according to Claim 102 further comprising the step of moving the selector to a first operating position such that the plasma arc torch is operated in a first mode to deliver gas to the plasma arc torch.